

REMARKS

This application is a continuation of PCT/GB00/01487 filed April 28, 2000. Claims 1-10 were present as originally filed, with claims 9 and 10 canceled and new claims 11-13 added by preliminary amendment. Claims 1-8 and 11-13 were pending in the application. In response to a restriction requirement dated November 13, 2002, Group I (claims 1-7 and 11-13) were elected. Claims 1-8 and 11-13 were, therefore, pending in the application with claim 8 withdrawn from consideration. Claims 1-8 and 11-13 are canceled above with new claims 14-23 presented. Claims 14-23 are, therefore pending in the application. Reconsideration of the application in view of the above amendment and following remarks is respectfully requested.

To address the claim objections detailed on page 2 of the Office Action and also to address rejections under 35 U.S.C. §112, second paragraph, claims 1-8 and 11-13 are canceled above and rewritten and presented as new claims 14-23.

Rejections under 35 U.S.C. §112, second paragraph

Claims 2, 4-7 and 11-13 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The rejection is overcome in view of the above amendments.

Rejections under 35 U.S.C. §102

Claims 1-7 and 11-13 are rejected under 35 U.S.C. §102(b) as being anticipated by FR2510140. According to the Office Action, FR2510140 teaches "solubilizing a mineral with a complexant, separating a liquid phase from any residue, titrating the resulting liquid phase to precipitate the mineral from the solution, and recycling the solution containing the complexant upon regeneration" and that FR2510140 teaches amino-carboxylic and quaternary ammonium compound as useful complexants.

The ability of chelating agents to enhance the solubility of a mineral has been known for nearly a century. The novelty of the present invention, therefore, lies not in the use of a chelating agent but in the method by which the mineral is removed from the chelating agent. In the present application, recovery of calcium sulfate is achieved by using a mineral acid to lower the pH of the chelate solution in which the calcium sulfate has been dissolved, thereby selectively precipitating the calcium sulfate.

New independent claim 14 (which replaces former claim 1) of the present application recites a method of purifying calcium sulfate (CaSO_4), from other materials, wherein the method comprises the steps of (a) contacting the materials containing the calcium sulfate with an aqueous medium at neutral or alkaline pH, and an acid-soluble chemical chelating reagent suitable for chelating calcium, thereby forming an aqueous chelate solution; and subsequently (b) recovering the calcium sulfate **by lowering the pH of said chelate solution with a mineral acid**, whereby calcium sulfate is selectively precipitated from said solution for recovery.

FR2510140 teaches a method of extracting carbonates by first solubilizing the material containing the carbonates with a complexant likely to solubilize at least one of the carbonate species (i.e., a chelator) to obtain a liquid phase including the solubilized carbonate species and possibly a solid residue; the liquid phase obtained is then separated from the residue, and the liquid phase is then **treated so as to precipitate the solubilized species** thereby regenerating the solution of the starting complexant (page 2, lines 10-14). The cited reference, however, does not teach, as stated by the Office Action, titration or pH manipulation for the regeneration of the complexant. Rather, for the precipitation step, the liquid phase undergoes a variation of temperature and in particular, an augmentation of temperature (page 7, lines 23-26.) This exploits the variation in saturation of the calcium carbonate in the complexant as a function of temperature (page 5, lines 10-12.)

Therefore, although the method taught by FR2510140 utilizes a chelating agent for solubilizing the starting material, the recovery of calcium carbonate in the method relies on *thermal* cycling (see Exemple 1, page 9, lines 24-30 and 33-38), and not on *pH* cycling as recited in Applicants' claimed method. In fact, the use of mineral acids in the method taught by FR2510140 would result in the decomposition of the carbonates which that method seeks to recover. Thus, Applicant respectfully submits that FR2510140 does not teach or fairly suggest Applicant's claimed method. Withdrawal of the rejection is respectfully requested.

Claims 1-7 and 11-13 are also rejected under 35 U.S.C. §102(b) as being anticipated by Paul et al. (U.S. Patent No. 5,151,196). Paul teaches a method of regenerating solvent used to remove barium sulfate scale. The scale is dissolved by contacting the scale with an aqueous solvent having a pH in the range between about 10 to 14, wherein the solvent comprises a chelating agent comprising a polyaminopolycarboxylic acid or salt thereof.


As discussed above, claim 14 recites a method of purifying calcium sulfate (CaSO_4), from other materials, wherein the recovery of the calcium sulfate is achieved by lowering the pH of said chelate solution with a mineral acid, whereby calcium sulfate is selectively precipitated from said solution for recovery.

The method taught by Paul et al. differs from Applicant's claimed method in that, unlike Applicant's method which is concerned with purifying calcium sulfate from a source material, Paul et. al is concerned with non-selectively ridding the chelation solution of whatever mineral sulfate it has accumulated; recovery of purified mineral sulfate is not envisioned by the method of Paul et al. Furthermore, though it relies on pH adjustment for regenerating the solvent, Paul et al. teach acidification of the chelation solution by adding acidic chelating agent (see abstract and column 3, lines 30-33); Applicant's method requires that the pH of the chelate solution be lowered with a mineral acid to recover calcium sulfate.

Thus, Applicant respectfully submits that Paul et al. does not teach Applicant's claimed method and withdrawal of the rejection is respectfully requested.

It is respectfully submitted that the above-identified application is now in condition for allowance and favorable reconsideration and prompt allowance of these claims are respectfully requested. The dependent claims are believed allowable for the same reasons as the independent claims from which they ultimately depend, as well as for their additional limitations. Should the Examiner require clarification of any of the above, the Examiner is invited to contact Applicants' undersigned attorney at the telephone number listed below.

Respectfully submitted,


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Dated: September 4, 2003

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